Species: *Polemonium eddyense* Stubbs, Mt. Eddy sky pilot

**Photo Source:** CalPhotos  
**Photo Credit:** Eric White (all photos)

**Status**

Table 1 summarizes the current status of this species or subspecies/variety by various ranking entities and defines the meaning of the status.

<table>
<thead>
<tr>
<th>Entity</th>
<th>Status</th>
<th>Status Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>NatureServe CAᵃ</td>
<td>G1,</td>
<td>G1: Critically Imperiled — At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors. S1: Critically Imperiled — Critically imperiled in the state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.</td>
</tr>
<tr>
<td>California Rare Plant Rankᵇ</td>
<td>1B.2</td>
<td>1B: Rare or endangered in California and elsewhere. 0.2: Fairly endangered in California. This taxon was originally listed in the CNPS <em>Inventory of Rare and Endangered Vascular Plants</em></td>
</tr>
</tbody>
</table>
Table 1. Current status of Mt. Eddy skypilot

<table>
<thead>
<tr>
<th>Entity</th>
<th>Status</th>
<th>Status Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>California State Listing</td>
<td>Not listed</td>
<td><em>of California</em> in 1980 under the name <em>P. chartaceum</em>, and its name was changed to <em>P. eddyense</em> in the CNPS Inventory in 2014 (CNPS 2020).</td>
</tr>
<tr>
<td>USDA Forest Service</td>
<td>Not listed</td>
<td></td>
</tr>
<tr>
<td>USDI FWS</td>
<td>Not listed</td>
<td></td>
</tr>
<tr>
<td>USDI BLM</td>
<td>Not listed</td>
<td></td>
</tr>
<tr>
<td>NatureServe OR</td>
<td>Not present</td>
<td></td>
</tr>
<tr>
<td>Oregon State Listing</td>
<td>Not present</td>
<td></td>
</tr>
<tr>
<td>NatureServe NV</td>
<td>Not present</td>
<td></td>
</tr>
<tr>
<td>Nevada State Listing</td>
<td>Not present</td>
<td></td>
</tr>
</tbody>
</table>

a California Natural Diversity Database, California Dept. of Fish & Wildlife [CNDDB 2020]  
b California Native Plant Society [CNPS 2020]  
c California Department of Fish and Wildlife [CDFW 2020]  
d US Forest Service Region 5 Forester’s List [USDA] and Pacific NW Survey and Manage [USDA & BLM 2014]  
e US Department of Interior Fish and Wildlife Service [USFWS 2020]  
f US Department of Interior Bureau of Land Management [BLM 2015]  
g Oregon Biological Information Center [ORBIC 2019]  
h Oregon Department of Agriculture [ODA 2018]  
i Nevada Natural Heritage Program [NNHP 2020]  
j Nevada Division of Forestry [NDF 2012]  

Note: Individual State Heritage Programs (CNDDB, ORBIC, NNHP) represent NatureServe and contain more up-to-date ranks for their state than NatureServe Explorer.

Distribution, abundance, and population trend on the planning unit

Table 2 summarizes the distribution and frequency of this species or subspecies/variety within National Forest System Lands in California. Table 4 in Appendix 1 lists all known occurrences of this species or subspecies/variety within California. Individual occurrences are defined as sites that contain an individual, population, or groups of populations of the plant that are located more than 1/4 (0.25) of a mile apart from each other as defined by the CNDDB.

Table 2. Known Occurrence Frequency of Mt. Eddy skypilot within the Planning Area (NRIS, CNDDB, Calflora/CCH databases)

<table>
<thead>
<tr>
<th>National Forest System (NFS) lands</th>
<th>Record #s (from Locations table below)</th>
<th>CNDDB EO(s)</th>
<th>Non-CNDDB Records</th>
<th>Recent (seen in past 20 years)</th>
<th>Historical (not seen in past 20 years)</th>
<th>Most Recent Obs. Date</th>
<th>Total Records on NFS lands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shasta-Trinity:</td>
<td>1, 2, 3</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>6-Jul-2020</td>
<td>3</td>
</tr>
<tr>
<td>Totals:</td>
<td>N/A</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>N/A</td>
<td>3</td>
</tr>
</tbody>
</table>

1 1909.12 Chapter 10, Section 12.53, components 2, 3, and 4.
Mt. Eddy skypilot was last updated in the CNDDB on May 29, 2014 (CNDDB 2020), and therefore all Calflora, CCH, and/or NRIS records prior to this date are assumed to have already been reviewed and entered into the CNDDB for this plant. Accordingly, only records from Calflora, CCH, and/or NRIS reported after this date have been reviewed for potential new or updated occurrence information and are included in Table 4 below as applicable.

Endemic to California, Mount Eddy skypilot is currently only known from three occurrences near the summit of Mount Eddy on the border of Siskiyou and Trinity Counties in the Klamath Ranges (KR) bioregion. All three location records are located on Shasta-Trinity National Forest lands, and none are located in Wilderness Area. One of them (record #1) is historical, while the other two are recent. Location record #1 had ca. 190 individuals in three colonies when last surveyed in the early 1990s. Location record #3 had eight to ten plants when observed in 2010. Record #2 is observed frequently, as it is near the trail to the summit. A survey of this occurrence in the early 1990s estimated 430 plants in three colonies. A seed collecting event on 20 August 2019 by CNPS found approximately 50 plants on the west side of the peak; however, this survey was not exhaustive since it was focused on obtaining seeds for seed banking (Magney pers. comm.). A 2020 survey of this occurrence estimated 325 plants; however, this survey was not exhaustive, because of the difficulty if counting plants on steep slopes as well as confidently estimating numbers of plants in a cluster (Calflora 2020, O’Dell 2020 pers. comm.). Therefore, the difference in the number of plants estimated in the early 1990s and in 2020 does not necessarily indicate a reduction in population size. Although potential habitat for the species occurs on Mount Eddy and elsewhere in the region, explorations of that habitat have not turned up additional populations. It is doubtful that more populations are present on Mount Eddy, and the three occurrences that have been documented may represent the true extent of Mount Eddy skypilot (O’Dell 2020 pers. comm., Kierstead 2020 pers. comm., Slakey et al. 2014, Stubbs 2020 pers. comm.).

Of the three records of Mount Eddy sky pilot, two are currently included in the CNDDB. The one non-CNDDB record (#3) is located more than 0.5 mile from a known CNDDB occurrence. This record seems to represent a new occurrence and should perhaps be evaluated for inclusion in the CNDDB (Lazar 2021 pers. comm.).

**Brief description of natural history and key ecological functions**

Mount Eddy skypilot is a short, tufted, multi-stemmed, perennial herb to 11 cm high that grows from a short rhizome and blooms from June to August. It grows on gravelly or rocky serpentinitized peridotite substrates, often in rock crevices, in alpine boulder and rock fields from 2,480-2,750 m (CNPS 2020, JEPS 2020, Stubbs and Patterson 2013). Associates include other alpine boulder/rock field species such as *Campanula scabrella*, *Eriogonum umbellatum*, *Ivesia gordonii*, and *Physaria occidentalis* (CNDDB 2020).

Mount Eddy skypilot bears blue flowers with a long style that protrudes from the corolla tube that indicates it is probably out-crossing. Like all members of the phlox family (Polemoniaceae), it produces a capsule fruit that dehisces to release 7-9 seeds, with each inflorescence containing approximately 8-15 flowers. Although little has been published on the ecology and reproduction of Mount Eddy sky pilot, some information can be inferred from close relatives in the genus *Polemonium*. Mount Eddy skypilot is one of a group of alpine skypilot species in the western United States that occur in high elevation alpine habitat, with four of those species present in California (Pritchett and Patterson 1998, Rose et al. 2020 in press, Stubbs and Patterson 2013).

---

1 Basis for other 1909.12 Chapter 10, Section 12.53 components.
One of the alpine skypilot species that does not occur in California, the widespread *P. viscosum*, is very well-studied with respect to its ecology and reproductive biology. Studies on *P. viscosum* have shown that the species is self-incompatible and nectar-producing with cross-pollination accomplished by a variety of insects, including bumble bees, solitary bees, and anthomyid and muscid flies (Galen 1992). Each flower typically sets 1-4 seeds, but seed production in some seasons is reduced due to damage by nectar-harvesting ants, aphids, and deer, and this damage increases at the warmer, lower elevational limits of the species distribution near timberline (Galen 1990). Grant made observations on two of the California alpine skypilots, *P. eximium* and *P. elegans*, and he reported that the species are out-crossing and nectar-producing and pollinated by syrphid flies and bumblebees (Grant and Grant 1965). Yonkow (1996) found that both *P. eximium* and *P. chartaceum* are primarily out-crossing with a low level of self-compatibility, and *P. chartaceum* is partly dependent on wind-aided pollination, although insect pollination was observed.

### Overview of ecological conditions for recovery, conservation, and viability

Currently, this species is only known from serpentine soils in alpine habitat on Mount Eddy in the Klamath Ranges. It is known from just three occurrences, all on Forest Service land, and the total number of individuals of Mount Eddy sky pilot is estimated at less than 700. Due to its narrow habitat requirements and its remote, alpine location, this species has limited ability to migrate to new habitat. The historical occurrence that has not been visited since 1991 (record #1) does not have a site occurrence rank in the CNDDB database, but the other two occurrences are ranked Good. The most likely immediate threat to this species is damage due to trampling by rock climbers and hikers; however, to date, the species has persisted successfully along a popular hiking trail. The most likely long-term threat to this species is climate change that is predicted to negatively affect high elevation species at the upper limits of their range, through changes in the timing of flowering, pollination, and seed germination (Brown et al. 2016, Gremer et al. 2020, et al. Hülber et al. 2010, Mondoni et al. 2012). In addition, the work of Galen (1992) has shown that the already limited seed output in some alpine skypilots is negatively affected by herbivory, and this increases at the lower (and warmer) extents of the their elevational range. Since Mount Eddy skypilot is a rhizomatous perennial, it may be able to persist for decades, despite unsuccessful reproduction, unless individual plants are negatively affected by increased summer temperatures or decreased snowpack. Conservation to date of this species has included both the purchase of private land by the Forest Service (so that all the occurrences are now located on Forest Service land) and seed banking at the University of California, Santa Cruz Arboretum (CNDDB 2020, CNPS 2020 pers. comm., Kierstead 2020 pers. comm.).

### Additional Considerations at the Forest Level

*This section, including the next 5 subheadings, would be filled out by Forest Service botanists.*

**<Forest Name>**

**Geographic distribution within the Forest**

A. Scarce or isolated
B. Patchy or gaps

---

3 1909.12 Chapter 10, Section 12.53, components 7, 9, 10, 11 and 12, as appropriate.
C. Contiguous

Abundance of the species on the Forest
A. Rare – current abundance is low enough that stochastic and other factors could lead to potential imperilment.
B. Uncommon – current abundance is large enough that demographic stochasticity is not likely to lead to rapid local extinction, but, in combination with highly variable environmental factors, could pose a threat.
C. Common – current abundance is large enough that species persistence is not threatened by demographic stochasticity in combination with environmental variation.
D. Insufficient information to draw inferences about criterion.

Population trend on the Forest
A. Significant downward or suspected downward population trend.
B. Stable population.
C. Upward population trend.
D. Insufficient information to draw inferences about criterion.

Habitat trend on the Forest
A. Decline in habitat quality or quantity.
B. Stable amounts of suitable or potential habitat, relatively unchanged habitat quality.
C. Improving habitat quality or increasing amounts of suitable or potential habitat.
D. Insufficient information to draw inferences about criterion.

Vulnerability of habitat on the Forest
A. Substantial modification of habitat has occurred or is anticipated with conditions departing from expectations based on NRV, and/or habitat is impacted by modern stressors such as drought, climate change, high intensity wildfire and wildfire suppression disturbances, loss of natural openings due to historic wildfire suppression, nonnative invasive species, water impoundments and diversions, and recreation, etc.
B. Habitat modification is likely to result in ecological patterns similar to the range of historical conditions, but is being impacted by modern stressors.
C. Habitat resilient, changes are similar in frequency and intensity to those expected from NRV, and modern stressors not significant.
D. Insufficient information to draw inferences about criterion.
Additional Forest specific information related to the SCC determination

This section is provided for Forest botanists to add additional Forest specific information that is not captured in the section above, if necessary. Provide a narrative description here of the additional relevant information. State “No additional information” if this section is not used.

**Taxonomy**

Table 3 summarizes this species or subspecies/variety’s name status in key literature.

<table>
<thead>
<tr>
<th>Entity</th>
<th>Name Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNDDDB and CNPS</td>
<td><em>Polemonium eddyense</em> Stubbs</td>
</tr>
<tr>
<td>Jepson eFlora</td>
<td><em>Polemonium eddyense</em> Stubbs</td>
</tr>
<tr>
<td>Jepson Manual (1993)</td>
<td>Species name not published in 1993 and so not included</td>
</tr>
<tr>
<td>Flora of North America</td>
<td>Volume not yet published</td>
</tr>
<tr>
<td>USDA NRCS® PLANTS</td>
<td><em>Polemonium eddyense</em> Stubbs</td>
</tr>
<tr>
<td>a Natural Resources Conservation Service [NRCS]</td>
<td></td>
</tr>
</tbody>
</table>

**Synonymy:** There are no synonyms for this species, as it was just published in 2013 (Stubbs and Patterson 2013, TROPICOS 2020). This species was included in *Polemonium chartaceum* H. Mason until 2013 (Stubbs and Patterson 2013).

**Jepson eFlora link:** [https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=99435](https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=99435)

**Type locality:** “California, Siskiyou Co., Klamath Mountains, summit of Mt. Eddy, 2750 m” (Stubbs 15, CAS) (Stubbs 2013).

**Key literature**


---

4 1909.12, Chapter 10, Section 12.53, component 1.
Literature cited


Species Account: *Polemonium eddyense*  

2021-10-21


**Persons Contacted**

[CNPS] California Native Plant Society, Rare Plant Program. 2020. Recent CNPS Rare Plant Treasure Hunt Form filled out by Annie Zell documenting seed collection of *Polemonium eddyense*. 


Magney, David. 2020. CNPS Rare Plant Program Manager. Personal communication (by Zoom meeting in August 2020) regarding population size and seed collecting of *Polemonium eddyense* on 20 August 2019 by Magney and Zell.


Author(s) and Date:
Ellen A. Dean, CNPS, 10 August 2020; revised 21 October 2021.

Reviewer(s) and Date:
Aaron E. Sims, CNPS, 5 October 2020; David L. Magney, CNPS, 7 October 2020; Julie A. Kierstead, USDA Forest Service Region 5 Ecosystem Planning, 10 December 2020.

Formatting: Form is set up as 508 compliant. Please use the “styles” if further formatting is necessary.

Purpose: This is to maintain the best available science on a species that could be used by the Forest Service in a variety of functions. Specifically, there would be additional steps and evaluations to determine whether or not this species would be considered a Species of Conservation Concern under the 2012 Planning Rule or a Sensitive Species under the 1982 Planning Rule.
Table 4. Known Occurrences of Mount Eddy sky pilot within California (NRIS, CNDDB, Calflora/CCH databases).

**Appendix 1: Known Occurrences**

Duplicate records from the same site are given the same record number and are included in red.

<table>
<thead>
<tr>
<th>Rec. #</th>
<th>Locality</th>
<th>County</th>
<th>Quad (Source)</th>
<th>Ref. (Source)</th>
<th>Date Last Obs’d</th>
<th>Population Info</th>
<th>Threats</th>
<th>Land Mgr.</th>
<th>Elev. (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>SUMMIT OF MOUNT EDDY, ABOUT 0.3 AIR MILE NW OF SUMMIT, PEAK 8881T TO THE E OF SUMMIT, AND HEADWATERS OF WAGON CREEK.</td>
<td>Siskiyou</td>
<td>Mount Eddy (4112234)</td>
<td>CNDDB, July 2020 (EO 2)</td>
<td>28-Jun-2013</td>
<td>IN 1990-1992, AT LEAST 26 PLANTS OBSERVED IN THE NW COLONY, 260 PLANTS IN THE MIDDLE COLONY, AND 150 IN THE COLONY ON PEAK 8881T. ~100 PLANTS NEAR SUMMIT IN 2010. ~6 PLANTS ON AND NEAR SUMMIT IN 2013. NOTED AS &quot;LOCALLY PLENTIFUL&quot; IN 1921.</td>
<td>FOOT TRAFFIC/TRAMPLING IS A POTENTIAL THREAT. CLIMATE CHANGE MAY POSE A POSSIBLE LONG-TERM THREAT.</td>
<td>Shasta-Trinity NF</td>
<td>8800</td>
</tr>
<tr>
<td>2</td>
<td>Mt. Eddy Summit, Steep N-facing and NW-facing slope of Mt. Eddy</td>
<td>Siskiyou</td>
<td>Mount Eddy (4112234)</td>
<td>CNPS Rare Plant Treasure Hunt form (CNPS 2020 pers. comm.)</td>
<td>20-Aug-2019</td>
<td>50 individuals on west slope of peak on rocky ridge with sparse vegetation dominated by low perennials.</td>
<td>trail expansion, hikers going off trail</td>
<td>Shasta-Trinity NF</td>
<td>9019</td>
</tr>
</tbody>
</table>
Duplicate records from the same site are given the same record number and are included in red.

<table>
<thead>
<tr>
<th>Rec. #</th>
<th>Locality</th>
<th>County</th>
<th>Quad Ref. (Source)</th>
<th>Date Last Obs’d</th>
<th>Population Info</th>
<th>Threats</th>
<th>Land Mgr.</th>
<th>Elev. (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Summit of Mt Eddy</td>
<td>Trinity</td>
<td>Mount Eddy (4112234)</td>
<td>Calflora 2020 (wb1883-254)</td>
<td>19-Jul-2017</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Summit of Mt Eddy</td>
<td>Trinity</td>
<td>Mount Eddy (4112234)</td>
<td>Calflora 2020 (po161481)</td>
<td>6-Jul-2020</td>
<td>2-10 plants.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Ultramafic scree and talus slopes above timberline on Mt Eddy.</td>
<td>Siskiyou</td>
<td>Calflora 2020 (mg90108)</td>
<td>26-Jun-2019</td>
<td></td>
<td></td>
<td>Shasta-Trinity NF</td>
<td>9016</td>
</tr>
<tr>
<td>2</td>
<td>Summit of Mt Eddy. full sunlight; peridotite and serpentinite (strict endemic); very gravelly sandy loam soil (pockets); moderately slopes to very steep slopes (all aspects); rock fall/talus and bedrock; growing in pockets and crevices. Individuals on north aspects flowering slightly later/longer than individuals on south aspects.</td>
<td>Trinity</td>
<td>Mount Eddy (4112234)</td>
<td>Calflora 2020 (wb2178-0 through wb2178-26)</td>
<td>4-Jul-2020</td>
<td>325 plants.</td>
<td>Shasta-Trinity NF</td>
<td>9009</td>
</tr>
</tbody>
</table>
### Duplicate records from the same site are given the same record number and are included in red.

<table>
<thead>
<tr>
<th>Rec. #</th>
<th>Locality</th>
<th>County</th>
<th>Quad</th>
<th>Ref. (Source)</th>
<th>Date Last Obs’d</th>
<th>Population Info</th>
<th>Threats</th>
<th>Land Mgr.</th>
<th>Elev. (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Mt. Eddy. Wagon Bowl.</td>
<td>Siskiyou</td>
<td>Mount Eddy</td>
<td>CNNDDB recent survey form</td>
<td>9-Aug-10</td>
<td>8 - 10 plants; 100 percent vegetative. Alpine habitat, above the treeline of Pinus albicaulis, growing among ultramafic boulders. Some die back (due to loss of snow pack?) noted. Otherwise, site condition Good.</td>
<td>Rock movement, natural disturbance. Climate change. Reduced snowpack. Surrounding use is backcountry recreation.</td>
<td>Shasta-Trinity NF</td>
<td>7955</td>
</tr>
<tr>
<td>3</td>
<td>Wagon Bowl, head of Wagon Creek.</td>
<td>Siskiyou</td>
<td>Mount Eddy</td>
<td>Calflora, June 2021 (po169868)</td>
<td>9-Aug-10</td>
<td>2 - 10 plants.</td>
<td></td>
<td>Shasta-Trinity NF</td>
<td>7933</td>
</tr>
</tbody>
</table>